

ABSTRACT

An improved via and contact hole fill composition and method for using the composition in the dual damascene production of circuits is provided. Broadly, the fill compositions include a quantity of solid components including a polymer binder and a solvent system for the solid components. The boiling point of the solvent system is less than the cross-linking temperature of the composition. Preferred solvents for use in the solvent system include those selected from the group consisting of alcohols, ethers, glycol ethers, amides, ketones, and mixtures thereof. Preferred polymer binders are those having an aliphatic backbone and a molecular weight of less than about 80,000, with polyesters being particularly preferred. In use, the fill composition is applied to the substrate surfaces forming the contact or via holes as well as to the substrate surfaces surrounding the holes, followed by heating to the composition reflow temperature so as to cause the composition to uniformly flow into and cover the hole-forming surfaces and substrate surfaces. The composition is then cured, and the remainder of the dual damascene process is carried out.